

REMARKS

This communication is a full and timely response to the aforementioned Office Action dated March 28, 2011. By this communication, claims 1 and 6 are amended. Claims 2-5 and 7-11 are not amended and remain in the application. Thus, claims 1-11 are pending in the application. Claims 1 and 6 are independent.

Reconsideration of the application and withdrawal of the rejections of the claims are respectfully requested in view of the foregoing amendments and the following remarks.

I. Rejections Under 35 U.S.C. § 112

Claims 1-11 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. In particular, the Office alleged that the phrase "the pipeline" lacked proper antecedent basis in claim 1. Applicants respectfully submit that the phrase "the pipeline" derived antecedent basis from the phrase "at least one pipeline" recited previously in the claim (see, e.g., line 3 of claim 1). However, in view of the indefiniteness rejections of the claims, claim 1 has been amended to recite the phrase "the at least one pipeline". Claim 6 has been amended similar to claim 1.

Accordingly, Applicants respectfully submit that claims 1 and 6, as well as the claims depending therefrom, provide proper antecedent basis for all the recited features. Therefore, Applicants respectfully request that the indefiniteness rejections of the claims be withdrawn.

In the section of the Office Action pertaining to the above-described indefiniteness rejection, the Office also inquired about the scope of the claimed invention, and required clarification (see paragraph "i" on page 3 of the Office Action). In particular, the Office provided the following comments:

If the intention is to have multiple pipelines carrying multiple process media streams, then the claim needs to be clear if the intention is to have sensors, thermoelectric transducers, etc in every pipeline or if they would only be in one pipeline. Moreover, please point out in the specification where multiple pipelines are discussed with multiple parts attached and integrated within, as it is not immediately clear to the examiner, if this is the intended interpretation. If the intention [is] to just have the sensor and thermoelectric [transducer] etc on one pipeline of a group which exist in the area, this too needs to be made

clear in the claim language. Please also cite support from the specification in your response when this is clarified.

In the above-quoted passage from the Office Action, the Office is apparently alleging that the claimed invention is indefinite because the scope of the claims (e.g., claims 1 and 6) is unclear. Applicants respectfully submit that the Office is confusing indefiniteness with the breadth of the claim. It is well-settled that the breadth of a claim is not to be equated with indefiniteness. If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. § 112, second paragraph. See *In re Miller*, 441 F.2d 689, 169 U.S.P.Q. 597 (C.C.P.A. 1971); M.P.E.P. § 2173.04.

Claim 1 recites an arrangement which includes a field device configured to monitor a technical process of a process installation in which there is at least one pipeline carrying process media in a first direction and having an opening formed in a surface of the at least one pipeline. The arrangement also includes an thermoelectric transducer.

As described in lines 22-32 on page 3 and in lines 5-18 on page 6 of the original specification, the process installation can include multiple pipelines carrying process media. For instance, lines 22-24 on page 3 of the original specification provide that "the thermoelectric transducer is thus arranged in or on the field device outside the pipelines which carry the process medium" (emphasis added). Figures 1 and 2 illustrate exemplary embodiments of an arrangement which includes a field device 10 that is configured to monitor a technical process of a process installation in which there is at least one pipeline 1 carrying process media in a first direction (arrow 1a, e.g., in the horizontal direction in Figure 1). The exemplary arrangements illustrated in Figures 1 and 2 also include a thermoelectric transducer 14 which is configured to convert heat flow in the field device 10 and/or heat flow through the thermoelectric transducer 14 into electric energy. The exemplary embodiments illustrated in Figure 1 and 2 clearly provide support for the recitation in claims 1 and 6 of a field device configured to monitor a technical process of a process installation in which there is at least one pipeline (e.g., pipeline 1 illustrated in Figures 1 and 2) carrying process media in a first direction and having an opening formed in a surface

of the at least one pipeline. As noted above, the specification provides support for a process installation including multiple pipelines. Accordingly, the specification and drawings provide clear support for an arrangement which includes a field device and a thermoelectric transducer being provided outside at least one pipeline (e.g., pipeline 1 in Figures 1 and 2) among the multiple pipelines involved in the process installation. The use of the phrase "the at least one pipeline" in claims 1 and 6 provides proper antecedent basis for by referring back to the pipeline(s) among the multiple pipelines of which the recited field device and thermoelectric transducer are arranged outside.

Accordingly, Applicants respectfully submit that the scope of the claimed invention is clear and fully supported by the exemplary embodiments disclosed in the specification and illustrated in the drawings. Applicants respectfully submit that the Office withdraw the objection to the scope of the claims as being improperly based on an objection to the breadth of the claims.

II. Rejections Under 35 U.S.C. § 103

Claims 1-11 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over ABB et al. (DE 20101112, hereinafter "ABB") in view of Bocko et al. (U.S. 2002/0145538, hereinafter "Bocko").

This rejection is respectfully traversed. The purported combination of ABB and Bocko cannot support the rejection of the claimed invention under 35 U.S.C. § 103(a), because these references do not establish that all the elements recited in the claimed invention were known in the prior art. See *KSR International Co. v. Teleflex, Inc.*, 82 USPQ2d 1385, 1395 (U.S. 2007); M.P.E.P. § 2143.02.

A. Exemplary Embodiment

With reference to Figure 1, for example, an exemplary embodiment of the present disclosure provides an arrangement which includes a field device 10 that is configured to monitor a technical process of a process installation in which there is at least one pipeline 1 carrying process media in a first direction (arrow 1a, e.g., in the horizontal direction in Figure 1). As shown in Figure 1 and as described in lines 6-7 on page 8 of the specification, the at least one pipeline 1 has an opening 1 formed in

its surface. The field device 10 has a housing 11, a sensor 8 which is configured to be inserted through the opening of the at least one pipeline 1 in a second direction substantially perpendicular to the first direction (e.g., in the vertical direction in Figure 1), a wire-free communication interface 5, at least one field device face 11a facing the process, and at least one field device face 11b facing away from the process.

The exemplary arrangement also includes a thermoelectric transducer 14 having a transducer face 14b facing the process and a transducer face 14c facing away from the process. The thermoelectric transducer 14 is arranged in or on the field device 10 outside the at least one pipeline 1 carrying the process media such that the transducer face 14b facing the process is arranged outside the at least one pipeline 1 carrying the process media. The transducer 14 is configured to convert at least one of heat flow in the field device 10 between the field device face 11a facing the process and the field device face 11b facing away from the process, and heat flow through the thermoelectric transducer 14 between the transducer face 14b facing the process and the transducer face 14c facing away from the process, to electrical energy for supplying electrical power to the field device 10.

The foregoing embodiment is encompassed by Applicants' claim 1, which recites an arrangement comprising a field device that is configured to monitor a technical process of a process installation in which there is at least one pipeline carrying process media in a first direction, where the pipeline has an opening formed in its surface. Claim 1 recites that the field device has a housing, a sensor which is configured to be inserted through the opening of the pipeline in a second direction substantially perpendicular to the first direction, a wire-free communication interface, at least one field device face facing the process, and at least one field device face facing away from the process.

In addition, claim 1 recites that the arrangement comprises a thermoelectric transducer having a transducer face facing the process and a transducer face facing away from the process. Claim 1 recites that the thermoelectric transducer is arranged in or on the field device outside the pipeline carrying the process media such that the transducer face facing the process is arranged outside the pipeline carrying the process media. Claim 1 also recites that the transducer is configured to convert at least one of heat flow in the field device between the field device face

facing the process and the field device face facing away from the process, and heat flow through the thermoelectric transducer between the transducer face facing the process and the transducer face facing away from the process, to electrical energy for supplying electrical power to the field device.

The applied references, either individually or in combination, do not disclose or suggest all the recited features of the claimed invention, for at least the following reasons.

B. ABB

With reference to Figure 1, ABB discloses a thermoelectric transducer in which a transducer face 142 facing the process media 3 is immersed in the process media 3 carried in the pipeline. ABB thus discloses that a first sensing point 142 projects through the wall of the pipeline to be immersed in the process media 3 carried in the pipeline, and a second sensing point 141 is provided within or outside the field device. The second sensing point 141 is thus provided at an ambient temperature level, whereas the first sensing point immersed in the process media 3 is provided at the temperature of the process media 3. The temperature of the process media 3 is then determined based on the temperature sensed at the first sensing point 142 immersed in the process media 3 and the ambient temperature level sensed at the second sensing point 141.

However, the arrangement of ABB results in the difficulty that the first sensing point 142, which is immersed in the process media 3, of the thermoelectric transducer must be protected against corrosion and contamination, thus adversely affecting the heat transfer from the process media 3 to the first sensing point 142, which degrades the efficiency of the thermoelectric transducer over time. Furthermore, fitting of the thermoelectric transducer with its first sensing point 142 immersed in the process media provides considerable design complexities, as there are some locations in which field devices are used in process installations in which it is impossible for the first sensing point 142 to be immersed directly in the process media 3.

In contrast to ABB, claim 1 recites that the thermoelectric transducer is arranged in or on the field device outside the at least one pipeline carrying the

process media such that the transducer face facing the process is arranged outside the pipeline carrying the process media.

Accordingly, ABB discloses an opposite configuration to that of claim 1. In particular, ABB discloses that the transducer face 142 facing the process media 3 carried in the pipeline is immersed in the process media 3 carried in the pipeline.

C. Bocko

The Office applied Bocko in attempting to cure the deficiencies of ABB for failing to disclose or suggest all the recited features of the claimed invention. The Office's reliance on Bocko is not supportable for several reasons. First, Bocko does not cure the deficiencies of ABB. In particular, similar to ABB, Bocko does not disclose or suggest a thermoelectric transducer which is arranged in or on a field device outside the at least one pipeline carrying the process media such that the transducer face facing the process is arranged outside the pipeline carrying the process media. Furthermore, the Office's interpretation of Bocko in striving to arrive at the claimed invention is not contrary to the *actual* disclosure of Bocko.

With reference to Figure 12, Bocko discloses that a thermoelectric module 30 is disposed between a solid base 22 and a radiator 50. With reference to Figure 3, Bocko discloses that the thermoelectric module 30 includes a hot side plate (Thot) (lower side) and a cold side plate (Tcold) (upper side) between which a number of p-type 32 and n-type 34 semiconductor elements are connected in series. Bocko discloses that the hot side (Thot) and cold side (Tcold) of the thermoelectric module 30 are thermally connected in parallel, while the semiconductor elements 32 and 34 are connected in series. Accordingly, to maintain electrical conduction and operation, the hot and cold base plates are required to be continuous above and below the semiconductor elements 32, 34. Referring back to Figure 12, Bocko discloses that the thermoelectric module 30 is arranged on a base 22.

In striving to arrive at the claimed invention, the Office alleged that the base 22 of Bocko could be broadly interpreted as corresponding to a "pipeline" that carries process media. The Office proposed this interpretation in an attempt to correspond the lower surface of the thermoelectric module 30 (i.e., the hot side plate) with the

transducer face facing the process, as recited in claim 1. This assertion is not supportable.

As disclosed in paragraph [0056], Bocko discloses that

the base 22 is mounted to a surface at an elevated temperature, relative to the surrounding air thereby providing a hot side. In usage, it is expected this elevated temperature will be generated as a natural by-product of mechanical, electrical, or chemical processes. For example, internal combustion engines generate a large amount of heat, which is normally wasted through dissipative processes. A surface in contact or near contact with such an engine would be much warmer than the surrounding air.

Accordingly, Bocko defines that the base 22, which is somehow supposed to correspond to a "pipeline" carrying process media, rests on a surface which is expected to dissipate heat during operation. At no point does Bocko disclose, suggest or contemplate that either the base 22 or the hypothetical "pipeline" below the base 22 have an opening through which a sensor is inserted. On the contrary, the sensor module 60 of Bocko is entirely disassociated from the surface of the process which is being monitored. Furthermore, as noted above, in order to operate the thermoelectric module 30, the hot and cold base plates must be thermally connected in parallel to both the semiconductor elements 32 and 34 which are connected in series. Consequently, the hot and cold base plates cannot be separated to form an opening therebetween to permit a sensor to be inserted through the base 22 and then through the surface of the process on which the base 22 is arranged.

Furthermore, the Office's assertion that the base 22 can correspond to a "pipeline" which carries process media in a process installation is not supportable. While the Office is afforded the broadest reasonable interpretation of a feature recited in a claim, the broadest reasonable interpretation of the claimed feature must be consistent with the interpretation that those skilled in the art would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111.

There is no disclosure, suggestion or contemplation in Bocko that the base 22 can constitute or correspond to a "pipeline" carrying processing media. On the contrary, Bocko discloses that the base 22 is a rigid surface between thermoelectric modules 30 and a passive radiator 50 (see paragraphs [0055] and [0056], and

Figures 9 and 12). One skilled in the art would not interpret the block 22 as corresponding to a "pipeline" which carries process media. Furthermore, even if the Office were to consider the base 22 as somehow corresponding to a "pipeline", in contrast to the ordinary and customary definition of this term, the base 22 is not capable of carrying process media in a process installation, since the base 22 is entirely enclosed on its upper, lower and lateral surfaces.

Accordingly, in contrast to claim 1, Bocko does not disclose or suggest an arrangement comprising a thermoelectric transducer which is arranged in or on the field device outside the pipeline carrying the process media such that the transducer face facing the process is arranged outside the pipeline carrying the process media in a first direction, where the pipeline has an opening through which a sensor of the field device is configured to be inserted in a second direction substantially perpendicular to the first direction.

Therefore, similar to ABB, Bocko does not disclose or suggest all the recited features of claim 1.

Furthermore, Applicants respectfully submit that the Office's proposed combination of ABB and Bocko is not supportable. It is well-settled that if a proposed modification of a reference would render the reference being modified unsatisfactory for its intended purpose, then there is no reason, suggestion or motivation to make the proposed modification. *See In re Gordon*, 221 U.S.P.Q. 1125 (Fed. Cir. 1984); M.P.E.P. § 2143.01.V.

As noted above, ABB requires that the transducer face 142 be immersed in the process media 3 in order to determine the temperature of the process media 3. Even if the Office were to improperly consider the base 22 of Bocko as constituting a "pipeline", in contravention to the ordinary and customary meaning of this term, Bocko requires that the hot and cold base plates must be thermally connected in parallel to both the semiconductor elements 32 and 34 which are connected in series, in order to operate the thermoelectric module 30. Consequently, the hot and cold base plates cannot be separated to form an opening therebetween to permit a sensor to be inserted through the base 22 and then through the surface of the process on which the base 22 is arranged. Therefore, combining ABB and Bocko in the manner proposed by the Office would prevent the transducer 142 of ABB from

being immersed in the process media, as required in ABB. Consequently, the proposed modification of ABB with Bocko would render ABB unsatisfactory for its intended purpose of measuring the temperature of the process media 3, since the transducer face 142 would be prevented from being immersed in the process media 3.

Therefore, Applicants respectfully submit that ABB and Bocko, either individually in combination, do not disclose or suggest each and every feature of claim 1, and that the proposed combination of ABB and Bocko is not supportable.

Accordingly, Applicants respectfully submit that claim 1 is patentable over ABB and Bocko. Claim 6 recites a method for supplying electrical power to a field device, where the method comprises monitoring a technical process in accordance with the above-described features of claim 1 which are not disclosed or suggested by ABB or Bocko.

Therefore, Applicants respectfully submit that claim 6 is patentable for similar reasons to those presented above with respect to claim 1.

It is noted that the Office, on page 8 of the Office Action, alleged that Applicants' prior remarks amount "to an allegation with no other support." It is unclear what the Office intended to convey with this assertion, because Applicants' prior response demonstrated how the ABB and Bocko, either individually or combination, fail to disclose or suggest all the recited features of the claimed invention. The foregoing remarks demonstrate the reasons why the rejection of the claimed invention is therefore legally and factually erroneous.

Dependent claims 2-5 and 7-11 recite further distinguishing features over the applied references, and are also patentable by virtue of depending from claims 1 and 6. The foregoing explanation of the patentability of claims 1 and 6 is sufficiently clear such that it is believed to be unnecessary to separately demonstrate the additional patentable features of the dependent claims at this time. However, Applicants reserve the right to do should it become appropriate.

III. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. Accordingly, a favorable examination and consideration of the instant application are respectfully requested.

If, after reviewing this Amendment, the Examiner believes there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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